VG91 Calibration Procedure

Manual Cal

1. Turn on both benches. To bring up computer, push button in located in the upper left corner with blue button.
2. Before starting the program on the computer for Calibration, turn unit upside down.
3. Plug in to the IEEE jack (in back of the unit) and plug in the gray waveform/vectorscope cable into the STD Video Output Jack (located on front of the unit).
4. Set the video pattern switch to Chroma Bar Sweep. Look at the vectorscope. The circle should run through the middle of the "B" box. If it doesn't, cal **R1376**. Make sure that the circle is coming together, if not cal **R1136**.
5. Start using the computer program.

Computer Calibration Outline

(NOTE: This is an outline of the computer cal instructions)

(Page 2) "Master Oscillator Adjustment"
1. Set the EL panel brightness to minimum.
2. Check LED'S. In EIA Color, R-G-B should be lit. Press the 3 to the right on and off. In Multiburst Bar Sweep, all bottom LED'S should be lit.
3. Hook the FC71 red test lead to **TP1002** and the black test lead to **TP1001**. Adjust **C1184** for a reading of **5.034964 MHZ +/- 12 Hz**

(Page 3) "Sync Level Adjustment"
1. Hook VG91 Video Output to the Waveform Monitor and Vectorscope through the gray cable with phono end.Turn on the low pass filter on the WFM. The VG91 should be in the EIA Color Split Field Pattern.
2. With the buttons below, adjust the **SYNC level** to **–40 IRE +/- 1 IRE**.

(Page 4) "Black Level Adjustment"
1. With the buttons below, adjust the **BLACK level** to **7. 5 IRE +/- 1 IRE**.

(Page 5) "Luminance Level Adjustment"
1. **100 IRE +/- 1 IRE**.

(Page 6) "Sub-Carrier Null Adjustment"
1. With VG91 in EIA Color Full Field Adjustment, turn on Chroma Filter on WFM.
2. Adjust **R1309 and R1310** for the best null.

(Page 7) " Color Bars Phase Adjustment"
1. With VG91 in Color bars, adjust **R1104** so the 3rd bar is 90 degrees (straight up).

(Page 8) "Color Bars Amplitude Adjustment"

1. With VG91 still in Color Bars, set filter on WFM to "FLAT".
2. Adjust **R1308** (add-on calpot near IC1181) so the color bar tips are at 100 IRE +/- 3. QA spec is +/- 5.

(Page 9) "Burst Level Adjustment"
1. Set vectorscope to 75% bars.
2. Adjust **R1209** for a burst level of 75%.

(Page 10) " Chroma Level Adjustment"
1. Adjust **R1208** for the correct chroma level. All points must be in or at least touch somewhere at the little boxes. (NOTE: You may have the use **R1309 and R1310**).

(Page 11) "Multiburst Inhibit Level Adjustment"
1. With VG91 to Multiburst pattern, probe the anode of **CR1026** using a scope probe.
2. Watch on SC61 so that the little pips are just below the bottom of the 4.5 Mhz bar. If not, adjust **R1044**.

(Page 12) "Multiburst Frequency Adjustment"
1. Hook video output of VG91 to SC61.
2. VG91 should be in multiburst pattern with all but 4.5 MHz bar off.
3. Adjust scope so you can see several cycles of signal.
4. Adjust delta time on SC61 to 1.777uS.
5. Adjust **R1136** so that 8 cycles just fit in the delta time.

(Page 13) "Circle Pattern Adjustment"
1. Hook up Y/C output to TV.
2. Adjust **R1020, R1025, R1041, R1042, and R1402** for best looking circle on TV.(See diagram)

(Page 14) "Monitor Color Bars"

(turn unit over)

(Page 15) "PLL Master Oscillator Adjustment"
1. Hook FC71 red test lead to **TP1** on RF board. Adjust **C166 for 6.400 MHz +/- 160 Hz**.
2. Hook RF output of VG91 to RF Spectrum Analyzer before proceeding.

(Page 16) "Audio SubCarrier Null Adjustment"
1. Probe **P4 pin 1** on audio board.

(Page 17) "SAP Carrier Null Adjustment"
1. (same as page 16)

(Page 18) "4.5 MHz Deviation Adjustment"
1. Remove the coax that goes from P1 on RF board to P2 on the audio board.

2. Hook P2 on the audio board to Ch. A on SC61.
3. Hook P1 on the RF board to Ch. B on SC61.
4. Set the SC61 to 2 V/D and 2 msec on the timebase. Make sure all digital button are out.
5. Click button below.
6. Adjust **R258** for deepest first bessel null.
7. Replace coax.

(Page 19) "Modulation Index Adjustment"
1. Connect RF output to Ch. A on SC61.
2. Connect RF video to Ch. B on SC61.
3. Push in vector button on SC61.
4. Using V/D cal knob on SC61 Ch. A. adjust left side of pattern to 4 large divisions. Use horizontal position knob and move pattern so you can see the right side. Check for 2 to 4 small divisions. If not, cal **R290** (located under the can).

(Page 20) SERVICE DEPARTMENT SKIPS OVER THIS CAL !!!!!!!

(Page 21) "A/V Ratio Adjustment"
1. Adjust **R242** on RF board for –15.5dB +/- 1 dB.

RF Leveling Calibration

1. Set up unit as follows: RF-IF signal to STD Cable, RF-IF Range to High, video pattern to Multiburst, MTS Stereo Mode to Mono, Audio Frequency to OFF, and SAP and Stereo Pilot to "0".
2. For units with Run #16 and newer, you will need to do the following: punch in 347 using the VG91. Make sure RF-IF Level is all the way CW. Set the video pattern to multiburst sweep. Push and hold in raster color "B" until display blinks on and off. Push "R" on the raster color to save the information. Next, punch in 348 to set the vernier levels. Use the down arrow until you have "050" on the display. Set the RF-IF level all the way CCW. Push "B" under raster color. Use the down arrow and look for "100" on the display. Push "B" to save. Use the down arrow and look for "300" on the display. Push "B" to save. Use the down arrow and look for "500". Push "B" to save. Push "R" The unit should display "2 STD".
3. Follow the Leveling Calibration on the computer to level the unit.

NOTE: All units Run 15 and under, use the old VG91 procedure found under "FILE".

4. When done leveling, check the levels as follows: Clear AFT by pushing both buttons in at the same time. Set VG91 to STD TV Ch. 2 on RF-IF signal, Video Pattern to External Modulation, MTS Stereo to MONO, and everything else off.
5. Go to the measuring receiver and push "Local", 55.25MHz and check verniers at 5 (QA spec is 57.8 to 51.8), "0" Norm(51.8 to 45.8), and 5(37.8 to 31.8).

MTS Calibration

1. (NOTE: ONLY DO THIS CAL IF UNIT FAILS FOR SEPARATION OR SRD WON'T SET UP PROPERLY. If unit fails right to left or left to right separation, have tech. Take to QA and cal in before MTSing. Once the tech cals it, it doesn't need to be MTS'D.
2. Turn unit off. Plug in IEEE cable to back of unit.
3. Plug in BNC cable to RF-IF output and phono end cable to STD Audio output.
4. Remove IC2 (169G266-66) and connect Rom- it into IC2.
5. Turn unit back on. Set SRD BTSC to S/D .
6. Start program and follow instructions. Make sure once the computer tells you to install blank eprom, disconnect cable by programmer and connect to back of programmer. The eprom is done programming when the programmer has stopped advancing in numbers.

VG91 Audio and THD Test

1. Connect the STD Audio Output from the VG91 to the 3561A Audio Analyzer input using a "BNC to Phono" cable.
2. Press "Recall" button on 3561A.
3. Press "State 1" button on 3561A.
4. Set the RF vernier on the VG91 to "max.".
5. Set the Audio Frequency switch on the VG91 to 300 HZ.
6. Set the video pattern switch to External Modulation.
7. Switch through all the audio positions and watch for the values listed below: (take the reading from the front of the Audio Analyzer 3561A.)

Switch frequency	Levels	Freq., Accuracy	THD
300 Hz	250 – 550 mV	298 – 302 Hz	NA
1 K	250 – 550 mV	998 – 1002 Hz	< 2%
3 K	250 – 550 mV	2998 – 3002 Hz	NA
5 K	250 – 550 mV	4998 – 5002 Hz	NA

8. Remove the Audio cable from the VG91 and the Audio Analyzer.
9. Connect the RF output of the VG91 the blonder-tongue input (the MTS RF cable).
10. Connect the left output of the SRD to the 3561A (audio analyzer).
11. Set the VG91 to Ch. 4, RF vernier to Max., frequency to 1Khz, MTS Stereo Mode to L&R, and SRD BTSC to L/R.
12. Set the SRD Reference level lights so that the green is "on" and the red is "off" by tweaking "A" input.
13. Make sure the stereo indication light is on.
14. Read the THD % on the Audio Analyzer. This must read <2%.
15. Set the MTS Stereo mode switch to "L" Channel.
16. Move the cable from the Audio Analyzer to the Fluke 45 banana connector.
17. Select AC Volts.
18. Select dB function. (This should read around 6.)
19. Push Rel (relativity) to zero Fluke 45. Rel will read on Fluke.(Should read zero or something is wrong.)
20. Switch cable on SRD to Right (Diff) output.
21. Read out of separation on the Fluke. Must be greater than 20.
22. Switch VG91 to "R" channel.

23. Push Rel. button on Fluke 45 twice to zero.
24. Switch cable on SRD to left (Diff) output.
25. Read out separation on Fluke 45.
26. Reading must be greater than 20.

FINAL CHECK

1. Carry unit to QA and double check the video patterns using their vectorscope and waveform monitor.
2. Double check the RF % Modulation in QA. To do this, set the VG91 to high, 5, 45.75MHz. video patterns switch to 10 bar staircase and everything else OFF.
3. Set the Sc61 to vector, both Ch. A & B Volts/Division to 2. Use Channel A cal knob to dial left side of signal 4cm on SC61.
4. Case unit and send to QA.